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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/252,514 02/18/99 NANDAKUMAR

M TX-23103

EXAMINER

023494 MM91/0928
TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS TX 75265

CRANE, S

ART UNIT

PAPER NUMBER

2811
DATE MAILED:

09/28/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/252,514

Applicant(s)

NANDAKUMAR ET AL.

Examiner

Sara W. Crane

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2001.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 12 July 2001 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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The amendment filed 11 July 2001 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

source/drain regions 34 formed around source/drain pockets 32 (The original disclosure and figure 1E teaches the source/drain regions 34 formed within the pockets 32.)

source/drain regions 34 implanted with an n-type material such as arsenic (The original disclosure teaches source/drain pockets 32 implanted with arsenic.)

source/drain pockets 32 extending within source/drain regions 34 (The original disclosure and figure 1E teaches regions 34 within pockets 32.)

source/drain regions 32 adjoining the channel region 24 (The original disclosure teaches that the pockets 32 adjoin the channel region.)

The amendment to figure 1E, changing the lines extending from "34" to point to region 32 of figure 1D, and the addition of "32" within the source/drain regions 34.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claims 1 and 3-17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as

to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification does not teach any embodiment having the combination of features recited. The "second doped region . . . having a greater charge-carrier mobility than [the] first region" is not taught anywhere in the specification. The specification teaches only that the second doped region has a greater charge-carrier mobility than *conventional surface channels*. (See, for example, page 7, lines 6-7.) The specification does not teach anywhere that the "first region" has the same charge-carrier mobility as a conventional surface channel.

Also, as noted previously, there is no teaching of the device of claim 9, where a subsurface layer is the primary conduction channel, and at the same time the subsurface layer has a lower concentration of dopant than the overlying layer. The specification does not address the question of the amount of counterdopant to be added to the respective channel regions as claimed, when the subsurface layer is utilized as the primary conduction channel.

Claims 1 and 3-17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

There is no teaching provided to enable one of ordinary skill to make a device having a subsurface doped primary channel layer having a greater charge-carrier

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mobility than an undoped or doped surface layer. Also, there is no teaching of how to make a MOSFET transistor having source and drain regions of the same conductivity type as the well, and having an oppositely-doped channel. If the source/drain regions are of the same conductivity type as the well, then the source-drain current will simply flow under the oppositely-doped channel layers, through the well.

Conclusion

Applicant does not provide any explanation or point to any support for the amendments to the specification or the claims. The pocket region 32 in figure 1D must correspond to the same region as shown in figure 1E. Region 32 could not shrink down somehow to become smaller in figure 1E than in figure 1D. Also, the source/drain regions are formed within the pocket regions, hence the name "pocket." And, while figures 1A-1E are all supposed to refer to the same embodiment, the specification says specifically that figure 1D is an example (having p-type pockets), and that figure 1E is another example (having n-type pockets). See the specification page 6, lines 9-11 and 23-25. At no point does the specification teach p type source/drain regions in combination with a p-type well, and one of ordinary skill would assume that the source/drain regions are not of the same dopant type as the well, because otherwise the device would not function as a transistor.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Crane, whose telephone number is (703) 308-4894.

The fax phone number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist, whose telephone number is (703) 308-0956.



Sara W. Crane
Primary Examiner
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